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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/597,194	06/20/2000	Alexander Mostov	TI-29732	6007

7590 10/27/2003

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EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2634	3

DATE MAILED: 10/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/597,194	MOSTOV ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-22* is/are allowed.

6)☒ Claim(s) *1-8,10-13 and 15* is/are rejected.

7)☒ Claim(s) *9,14, and 16-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2000* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-5 recite the limitation "a plurality of logM and logN control lines" in claims 2 and 4. There is insufficient antecedent basis for this limitation in the claim. A plurality of logM and logN controls lines is not disclosed in the preceding claims or the specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-8, 10-13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ciccarelli et al. (U.S. Patent No. 6, 498, 926).

Regarding claim 1, Ciccarelli et al. discloses a communications receiver comprising:

LNA (Fig. 2, block 1220a and 1220b) for amplifying a received signal so as to generate an LNA output signal, the LNA having M IIP3 setting modes of operation, the IIP3 of the LNA

determined in response to an LNA IIP3 control command (column 13, lines 5-43), wherein operation at the lowest and highest IIP3 point are the modes of operation;

a mixer (Fig. 2, block 1230) for multiplying the LNA output signal with a local oscillator signal (Fig. 2, block 1228) so as to generate a mixer output signal, the mixer having N IIP3 setting modes of operation, the IIP3 of the mixer determined in response to a mixer IIP3 control command signal (column 13, lines 5-43), wherein operation at the lowest and highest IIP3 point are the modes of operation;

a detector (Fig. 2, block 1250, column 6, line 63-column 7, line 29) for recovering from the mixer output signal, information originally transmitted;

a controller (Fig. 2, block 1280) to generate the IIP3 control command to the LNA and the mixer IIP3 control command to the mixer, the controller adapted to set the setting of the LNA and of the mixer to one of a plurality of IIP3 states wherein each IIP3 state consists of a unique combination of LNA IIP3 settings and mixer IIP3 settings (column 7, lines 53-58 and column 13, lines 5-43).

Ciccarelli et al. does not disclose controlling the gain of the LNA and mixer rather than the IIP3 to process the signal. However, Ciccarelli does disclose controlling the voltage bias of the LNA and mixer which controls the IIP3. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the IIP3 operating point (third order intercept point) is set in accordance with the amount of non-linearity which is dependent on the amplitude of the signal. The amplitude of the signal thus depends on the gain settings of the devices in the receiver (column 6, lines 13-22). Therefore, it would have obvious that in order to adjust the IIP3, the amplitude of the signal must be adjusted by adjusting the gain in the devices of the

receiver. Thus, the bias that is applied to the LNA and the mixer adjusts the gain of the LNA and mixer in order to control the IIP3. Thus, claim 1 does not constitute patentability.

Regarding claim 6, which inherits the limitations of claim 1, Ciccarelli et al. discloses a band pass filter located before the LNA and adapted to filter the signal received from the antenna (Fig. 2, block 1226, column 7, lines 29-45).

Regarding claim 7, which inherits the limitations of claim 1, Ciccarelli et al. discloses a band pass filter located before the mixer and adapted to filter the signal received from the antenna (column 7, lines 29-45), wherein the filter is placed before the mixer to optimize receiver performance.

Regarding claim 8, which inherits the limitations of claim 1, Ciccarelli et al. discloses a band pass filter located after the mixer and adapted to filter the mixer output (Fig. 2, block 1232, column 7, lines 29-45).

Regarding claim 10, Cicarrelli et al. discloses all the limitation of claim 10 (see rejection of claim 1) including the LNA and mixer having low gain and high gain mode and the controller adapted to set the gain setting of the LNA and mixer to one of four gain states (column 13, lines 5-43), wherein operating at the highest IIP3 point is the high gain mode and operating at the lowest IIP3 is the low gain mode for each device and the combination of the operating modes gives the four gain states. For example, one state is when a jammer is detected and the IIP3 of the mixer is increased, but the IIP3 of the LNA remains the same. Thus, the mixer is operating at a high IIP3 (gain) mode and the LNA is operating at a low IIP3 (gain) mode.

Regarding claims 11-13, the claimed device includes features corresponding to subject matter mentioned in the above rejection of claims 6-8 which is applicable hereto.

Regarding claim 15, which inherits the limitations of claim 10, Ciccarelli et al. discloses the controller is operative to set the LNA to a low IIP3 (gain) mode and the mixer to a low IIP3 (gain) mode to achieve maximum linearity and maximum third order intercept point (column 13, lines 20-26).

Allowable Subject Matter

5. Claims 9, 14, and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 19-22 are allowable over prior art because prior art references do not disclose setting the LNA and mixer to different gain modes to improve linearity while reducing sensitivity and a controller which switches to a state having a lower sensitivity in response to a low correlation; a controller which switches the receiver back to a previous state if the error rate obtained in a new state is worse than the error rate in a previous state; and a controller which sets the receiver to a low gain state in response to a high RSSI reading and a high error rate.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nguyen (U.S. Patent No. 6, 298, 221) discloses using a device to control the gain of an amplifier and a mixer in a receiver.

Hutchison, IV et al. (U.S. Patent No. 5, 722, 061) discloses controlling the gain of an amplifier and mixer in a receiver.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 709-872-9306 for regular communications and 703-872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Curtis Odom
October 16, 2003

STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2600